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INSPECTION OF FOREIGN BULBS

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With the promulgation of the Nursery Stock, Plant and Seed Quarantine No. 37, effective June 1, 1919, certain foreign bulbs first came under plant quarantine control. Before that time plant quarantine regulations of the United States had not applied to them.

As promulgated, the Quarantine did not provide for inspection by the Federal Department of Agriculture, but it did provide that a notice should be sent to the states to inform them of the impending arrival of the shipments for importers within their borders. By September of the same year it had become quite obvious that the various states would have a tremendous job to accomplish if they were to follow up these bulb importations and effectively inspect them. Therefore, the U. S. Department of Agriculture, in agreement with the states, accepted the responsibility of inspecting foreign bulb importations at the ports of entry, thus relieving the states of an onerous responsibility which, because of the circumstances, was difficult to accomplish.

Thereafter, and until World War II prevented bulb shipments from most of the foreign nations, representatives of the U. S. Department of Agriculture inspected bulbs at the ports of entry. Such inspection was in nearly every case accomplished on the piers, under conditions that were far from adequate for the performance of the work. In the early part of the importing season, summer heat was still a problem and reduced the flowering quality of bulbs that were unavoidably detained on the hot docks for inspection. Later, low temperatures were the problem, both for the bulbs and the inspectors making the examination.

Added to temperature difficulties were those of poor lighting, excessive labor costs for cooperage, delays in the opening of the bulb cases, and pilferage by unknown persons, following completion of the plant quarantine examination and before the cases were again closed by the coopers. Heat and cold damage, labor charges of coopers, and pilferage losses all affected the American buyer. Furthermore, the poor conditions for examination made it difficult for plant quarantine inspectors to do a satisfactory job in all instances.

During those years various bulb importations were received in poor condition and some shipments had to be refused entry because of the presence of important insect pests or plant diseases. Others, while carrying no pests of plant quarantine significance, were nevertheless infested or infected with cosmopolitan pests that seriously affected

their grade and quality. Often such conditions probably resulted because the shipper, never having seen how his bulbs finally arrived, did not know how he must prepare them to prevent the development of rot and scavenger organisms. This has been admitted in recent years by some of the shippers who have told how differently the bulbs were prepared 25 or 30 years ago.

Following World War II, bulb shipments to the United States were resumed by the former exporters. Pest findings in the years 1946 and 1947 necessitated the refusal of some infested and infected shipments. As a result, the Netherlands government asked that the then Bureau of Entomology and Plant Quarantine send representatives to that country to study the bulb problem and offer suggestions. Accordingly, two workers made spring and summer visits to the Dutch bulb growing areas in 1948 to observe conditions and offer suggestions. They gave particular attention to the iris nematode problem and were able to demonstrate the presence of that pest in the growing crop. In facing this problem in the summer of 1948 the Dutch bulb exporters decided to hot-water treat iris offered for export to the United States, although they were fearful the treatment might seriously damage the bulbs, since infected bulbs treated after arrival in the United States invariably showed extensive hot-water injury. This fear of injury was not shared by Professor van Slogteren, Director of the Bulb Research Laboratory at Lisse, who had developed it. The later forcing results in this country of the treated iris confirmed Professor van Slogteren's belief that injury did not result if the bulbs were treated before roots in the basal plate began their early autumn growth.

In 1951, three years later, the Netherlands government and the Holland Bulb Exporters Association asked that the U. S. Department of Agriculture perform country-of-origin bulb inspection. In the same year the work was undertaken on an experimental basis, under terms of assigned agreement specifying the conditions under which the work was to be done. All transportation and living costs were to be paid by the Dutch exporters through money deposited with the Department. Inspectors were reimbursed for their expenses by the U. S. Treasury at the rates prescribed by government travel regulations. Automobile transportation within Holland was furnished by the Exporters Association. No funds of any kind were received by the inspectors directly from the Dutch.

As the work is now carried on, at least one representative of the Plant Quarantine Branch is in the Netherlands throughout most of the year. During the two months of peak activity, four other men join him in the work. Therefore, bulb inspection might be considered to begin in the spring when the various bulb crops are in flower. At that time a Branch representative, in collaboration with inspectors of the Phytopathological Service and the Holland Bulb Exporters Association, does field work

to eliminate diseases and insect pests. Later, a representative of the Branch is able to see a portion of the bulbs as they are harvested. Thereafter, the inspector is able to see the bulbs during cleaning and grading, and he is free to examine them in storage on the warehouse shelves. Later he sees them during packing operations and finally examines them when he is notified they are ready to be shipped.

In all these activities the American inspector is associated with his Dutch counterparts, and especially so during the packing and final preparation of the bulbs for export.

The bulb exporting area of Holland is found in the region surrounding the cities of Sassenheim, Lisse, Hillegom, and Haarlem. It is a strip of sandy soil only a short distance inside the dunes of the North Sea. The region is divided into numerous smaller districts. Each is presided over by an inspector of the Phytopathological Service who makes a continuing check of the bulb shippers in his area to insure compliance with the regulations of the importing countries. These men are in turn directed by a chief inspector and his two assistants. Daily, before 9:00 A.M. the district inspector or the shippers under his jurisdiction notify the chief inspector of bulb shipments that will be ready for final examination on that date. At 9:00 o'clock the Branch representatives receive from the chief inspector a list of packing houses to be visited. They then go to their assignments in teams of two, each team being accompanied by either the head Dutch inspector or one of his two assistants, all of whom speak English fluently. The Dutch inspector who does not accompany the Americans goes with the Canadian inspectors.

As the members of each team examine bulbs offered for export they make written notes of findings. Any conditions encountered that require correction are immediately called to the attention of the Dutch member of the team who in turn instructs the shipper on the changes to be made. Later, this man informs his district inspector of the needed corrections so a follow up can be accomplished. If conditions encountered in any lot of bulbs are considered to be of definite plant quarantine significance, the Branch representatives recheck the shipment to make sure the objectionable condition has been remedied.

When the inspectors are finally satisfied with the shipment, the Dutch Phytopathological Service issues the phytosanitary certificate and the Branch representative places his release on it. When the bulbs finally arrive at U. S. ports of entry, the shipping papers are checked. If the Branch release is present, the importation is immediately permitted to be delivered. However, if by some unusual combination of circumstances the shipment papers do not carry the Branch release, the bulbs are examined on the dock, and their release or rejection will depend upon the findings made at that time.

When the total volume is considered, the inspections today reveal surprisingly few lots of bulbs that do not meet the strict requirements for export.

Soil contamination is one of the first things looked for and when found, the offending bulbs are recleaned, even though they may have already been placed in bags within the shipping cases. Insect pests, true plant diseases, and rot organisms, even when cosmopolitan, necessitate a cleanup, even though found in rather low amounts. Such action is in the end considered advantageous by the shipper since it raises the grade and quality of the exported product going to the American market, a market known for its demand for carefully graded, quality merchandise. The cleanup is accomplished by a re-sorting of the bulbs, a substitution of a clean lot for the infected lot, or a treatment. Among the organisms in this category are the following, which are believed to be widely distributed in those parts of the United States where like bulbs are grown:

Insects:	<u>Anuraphis tulipae</u>	Tulip bulb aphid
	<u>Lampetia equestris</u>	Narcissus bulb fly
	<u>Rhizoglyphus solani</u>	Bulb mite or hyacinth mite - scavenger
	(<u>R. hyacinthi</u>)	
	<u>Steneotarsonemus laticeps</u>	Bulb scale mite
	<u>Taeniothrips simplex</u>	Gladiolus thrips
Diseases:	<u>Botrytis elliptica</u>	Botrytis blight of lily
	<u>Botrytis gladiolorum</u>	Botrytis disease of gladiolus
	<u>Corynebacterium fasciens</u>	Fasciation disease of dahlias and gladiolus
	<u>Ditylenchus destructor</u>	Nematode in bulbous iris
	<u>Fusarium oxysporum</u>	Corm rot of crocus
	<u>Fusarium oxysporum f. gladioli</u>	Fusarium rot of gladiolus
	<u>Fusarium oxysporum f. narcissi</u>	Basal rot of narcissus
	<u>Mystrosporium adustum</u>	Ink spot disease of <u>Iris reticulata</u>
	<u>Pseudomonas marginata</u>	Bacterial scab, mainly on gladiolus corms
	<u>Rhizoctonia tuliparum</u>	Gray bulb rot of tulips
	<u>Sclerotinia narcissicola</u>	Smolder or neck rot of narcissus
	<u>Septoria gladioli</u>	Hard rot of gladiolus
	<u>Stromatinia gladioli</u>	Dry rot of gladiolus
	<u>Urocystis colchici</u>	Colchicum smut

The following diseases, not so widely reported in the United States, cause rejection of the infected lot of bulbs, when they are found:

<u>Ditylenchus dipsaci</u>	Bulb nematode mainly on narcissus
<u>Ditylenchus dipsaci</u>	In hyacinth bulbs
<u>Ditylenchus</u> sp.	In colchicum corms
<u>Ditylenchus</u> sp.	In scilla bulbs
Tobacco necrosis virus	In tulip bulbs
<u>Xanthomonas hyacinthi</u>	Yellows disease of hyacinths

Many persons associated with the bulb industry, whether as exporters in the Netherlands or as importers in the United States, have indicated their satisfaction with the results of the six years of preshipment inspection and they have indicated their wish that it shall continue as a regular activity of the Plant Quarantine Branch. It is hoped that those not familiar with the manner in which the work is conducted will have a better understanding of the matter after reading this statement.

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